	Application No.	Applicant(s)
Notice of Allowability	09/899,852	RIESS ET AL.
	Examiner	Art Unit	
	Kandasamy Thangavelu	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *January 23, 2006*.

2. ☒ The allowed claim(s) is/are *1-19*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
        Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date *February 2, 2006*

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☒ Other *Clean copy of allowed claims*.

DETAILED ACTION

Introduction

1.   This communication is in response to the Applicants' communication dated January 23, 2006. Claims 1, 2, 5, 6, 8, 13 and 17 were amended. Claims 1-19 of the application are pending.

Information Disclosure Statement

2.   Acknowledgment is made of the information disclosure statements filed on February 2, 2006 together with a list of patents. The patents have been considered.

Examiner's Amendment

3.   Authorization for this examiner's amendment was given in a telephone interview with Mr. Robert Hails, Jr. on March 2, 2006.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

4.   The application has been amended as follows:

In amended claim 1, Line 1, "method"

has been changed to

-- method for use in a communication system for transmitting symbols of a high order

constellation--.

In amended claim 6, Line 1, "method"

has been changed to

-- method for use in a communication system for transmitting symbols of a high order

constellation--.

In claim 7, Line 7, "a coefficient"

has been changed to

-- a coefficient representing any prior knowledge of intersymbol interference effects--.

In claim 8, Line 7, "a coefficient"

has been changed to

-- a coefficient representing any prior knowledge of intersymbol interference effects--.

In amended claim 13, Line 1, "reliable symbols"

has been changed to

-- reliable symbols for use in a communication system for transmitting symbols of a high

order constellation--.

In claim 14, Line 3, "coefficient c_i"

has been changed to

-- coefficient c_i, representing any prior knowledge of intersymbol interference effects --.

In amended claim 17, Line 1, "reliable symbols"

has been changed to

-- reliable symbols for use in a communication system for transmitting symbols of a high

order constellation--.

In amended claim 17, Line 4, "each of the plurality of constellation points associated"

has been changed to

-- reliable symbols for use in a communication system for transmitting symbols of a high

order constellation--.

A clean copy of allowed claims is attached.

Reasons for Allowance

5.   Claims 1-19 of the application are allowed over prior art of record.

6.   The following is an Examiner's statement of reasons for the indication of allowable

subject matter:

-   The closest prior art of record shows:

(1) systems and methods for communicating radiophone communications over a

radiophone communication channel; methods for achieving a desired bit error rate without

requiring a complex optimal estimating filter; the transfer characteristic of the channel is

estimated from the predetermined pilot symbols and a data sequence including data

corresponding to both the pilot symbols and the communication symbols; the method uses an

iterative estimation of information symbols and the channel characteristic; estimates of

information symbols are generated from previously estimated information symbols and the

newly estimated information symbols are used to generate new estimates of the channel

characteristic; generating a group of information symbols data corresponding to a group of

information symbols adjacent to previously estimated information symbols; the identified group

of symbols is the one for which the estimated error probability is less than a predetermined

threshold (**Hassan,** U. S. Patent 5,901,185);

(2) decoding information symbols from symbol modulated radio signal; the decoder

includes a channel estimator to estimate the coefficients of the channel through which the signal

is propagated; a signal predictor combines the channel estimates with the corresponding samples

of the signal to obtain a likelihood indication; a maximum likelihood sequence estimator is used

to compensate for the ISI effects; the maximum likelihood or viterbi algorithm for decoding an

information symbol modulated signal comprises sampling the signal to obtain samples that each

depend on a limited number of sequential information symbols; the hypothesized sequences are used to predict the sample value; the method predicts an expected value of signal samples for each of the hypothesized sequences and compares the actual values of signal samples with the predicted values of signal samples to determine a likelihood value for each of the sequences; the decoder comprises a maximum likelihood sequence estimator; a sequence of complex vector values are produced , each one being a weighted sum of several adjacent complex symbol values; the weighting factors are channel coefficients determined from the received signals by correlating with the known symbols included in the transmission (**Dent,** U. S. Patent 6,347,125);

(3) a radio frequency communication system using a maximum ratio combining technique to recover transmitted signals; in a QAM constellation, the received signal drepends on the channel gain; in the receiver, a demodulator receives the modulated signal transmitted via various paths; the demodulator samples the received signals and outputs the pilot and data symbol samples; the pilot symbols are used in the channel gain estimator, which outputs an estimate of the fading gain of the channel corresponding to each data symbol for each received signal; a diversity combiner takes as inputs the channel gain estimates, data symbols and weighting factors and outputs the recovered data symbols (**Jasper et al.,** U. S. Patent 5,553,102); and

(4) a method to select data rate based on error signals in a modem; the mean square error at the output of the equalizer is determined and used along with the probability of error in correctly detecting a symbol to select a data rate; a FIR filter is used which computes a weighted sum of samples and coefficients; the method of computing weighted sum of samples combats the effects of noise and intersymbol interference ; the error signal is used to adapt the coefficients;

each element of the new signaling alphabet is determined by collecting a sufficient number of

digital samples from the decision feedback equalizer and then computing their average; the

average is used as a candidate for the new alphabet number or constellation point (**Abdelilah et

al.**, U. S. Patent 6,661,837).

None of these references taken either alone or in combination with the prior art of record

discloses a channel gain estimation method for use in a communication system for transmitting

symbols of a high order constellation, specifically including:

(Claim 1) "identifying reliable symbols from a sequence of captured data samples

recovered from a communication channel;

estimating a constellation size from a set of maximally-sized reliable symbols;

estimating a gain of the communication channel based on the estimated constellation

size".

None of these references taken either alone or in combination with the prior art of record

discloses a reliable symbol identification method for use in a communication system for

transmitting symbols of a high order constellation, specifically including:

(Claim 6) "calculating a reliability factor of a candidate sample from constellation points

nearest to each of a plurality of other samples in proximity to the candidate sample, wherein the

candidate sample and the plurality of other samples represent a data signal recovered from a

communication channel,

if the reliability factor is less than a predetermined limit, designating the candidate

sample as a reliable symbol".

None of these references taken either alone or in combination with the prior art of record

discloses a method of identifying reliable symbols for use in a communication system for

transmitting symbols of a high order constellation, specifically including:

(Claim 13) "adding to a reliability factor a value derived from a constellation point

nearest to a sample y_{n-i},

if the reliability factor exceeds a predetermined limit, disqualifying the candidate sample

as a reliable symbol, and

unless the candidate symbol has been disqualified, designating the candidate sample as a

reliable symbol".

None of these references taken either alone or in combination with the prior art of record

discloses a method of identifying reliable symbols for use in a communication system for

transmitting symbols of a high order constellation, specifically including:

(Claim 17) "determining whether any of a plurality of constellation points is within a

predetermined threshold, where each of the plurality of constellation points is associated with

samples neighboring the candidate sample also recovered from a communication channel,

if none of the constellation points exceed the threshold, designating the candidate sample
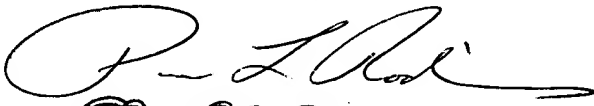
as a reliable symbol".

7.   Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

8.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez, can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to TC 2100 Group receptionist: 571-272-2100.

K. Thangavelu
Art Unit 2123
March 2, 2006

Paul P. Rodriguez
Primary Examiner
Art Unit 2125